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10/799,428	03/12/2004	Michael T. Rowan	68865.001007	8147

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HUNTON & WILLIAMS LLP
INTELLECTUAL PROPERTY DEPARTMENT
1900 K STREET, N.W.
SUITE 1200
WASHINGTON, DC 20006-1109

EXAMINER	
GU, SHAWN X	

ART UNIT	PAPER NUMBER
2189	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/799,428	ROWAN ET AL.	
	Examiner	Art Unit	
	Shawn X. Gu	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-35,37-44 and 50* is/are rejected.

7)☒ Claim(s) *36,45-49 and 51-55* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/9/04,12/16/04,1/4/06,6/2/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements (IDS) submitted on 9 August 2004, 4 January 2006 and 2 June 2006 were filed after the mailing date of the application on 12 March 2004 and before the mailing date of the first Office action. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Items C1, C5, C27 and C28 of the information disclosure statement filed 16 December 2004 fail to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because they do not contain the publication dates or retrieval dates of the non-patent literature documents by month and year. All items except the above listed items have been considered by the Examiner. See MPEP § 609.04(a).

Specification

2. The Applicant is reminded that any change in the status of the parent application 10/668,833 needs to be updated in paragraph [0001] of the instant application's specification.

Claim Objections

3. Claim 55 is objected to because of the following informalities:

On line 2, "the data" should be "a data". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 30 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Per claim 30, it is suggested that the first data store and the second data store are exactly the same as each other. This feature is not taught by the written description. In fact, paragraph [0036] of the specification teaches a same data store can be configured to respond to requests prior to the time of corruption. Nothing is said about the first data store and the second data store being exactly the same as each other. Appropriate correction is required.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 30, 34 and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Per claim 30, it is claimed that the first data store is the same as the second data store. This claim is indefinite because it is unclear how the two data stores are exactly the same when the second data store contains data stored in the first data store in a past time while it is not known whether or not the first data store in fact also contains this data in the same past time as implied by the language in claim 26. If the two data stores are in fact the same, then why is a determination made as taught in the last step of claim 26 if it is already know the second data store contains this data in the said past time.

Per claim 34, line 2 recites "the data store". This limitation is indefinite because claim 26 recites a first data store and a second data store. It is unclear which one of them is referred to by "the data store" in the instant claim.

Per claim 37, line 2 recites "the step of continuously saving information". This limitation lacks sufficient antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

9. Claims 26-29, 31-35, 37-44 and 50 are rejected under 35 U.S.C. 102(e) as being anticipated by Wu et al. [US 6,981,114 B1] (hereinafter "Wu).

Per claim 26, Wu teaches a method for identifying a time at which first data (the modified block value since a snapshot for a point in time was made) was written to a first data store (the Mirror Volume 240, see Fig. 2), comprising the steps of:

configuring a second data store (Modification Log 260 in Backup Device 250 in Fig. 2) to respond to data requests made to the second data store with data stored in the first data store at a first time in the past (retrieve pre-modification values in modification log entries to fulfill reconstruction/restoration requests; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55 for the restoration process and snapshot reconstruction);

requesting second data from the second data store (data requests are made to the Modification Log 260 during the restoration/reconstruction process for the modification log entries that hold the pre-modification values of the modified blocks; the second data is the combination of the pre-modification values and the recording of the modifications to the modified blocks which indicate the blocks have been modified, see col. 10, lines 44-48 for "modifications detected between T1 and T2"; also see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55);

receiving the second data (values in the modification log entries are received during the restoration/reconstruction process; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55); and

determining from the second data if the first data store contained the first data at the first time (the managing software programs shown in Fig. 2 must make this determination, otherwise it cannot possibly be known that the modification log 260 should be read for snapshot reconstruction at a particular time point, see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55; part of the reconstruction process includes deciding whether to retrieve data from the Mirror Volume 240 or from the Modification Log 260 depending on whether or not the block data has been modified since a particular snapshot for a point in time was made, see col. 10, lines 31-55; also see col. 10, lines 44-48 for "modifications detected between T1 and T2"; note that the modification log 260 is the only data source that has records of the existence of a particular data value in a particular address at a particular time, after the deletion of the snapshot related to that point in time and the overwriting of the address).

Per claim 27, Wu further teaches configuring the second data store to respond to data requests made to the second data store with the data stored in the first data store at a second time in the past;

requesting third data from the second data store;

receiving the third data from the second data store; and

determining from the third data if the first data store contained the first data at the second time (restoring/reconstructing volume state at any point in time, see col. 9, lines 45-61 and col. 10, lines 12-55; also, one reconstruction process may require the transfer of pre-modification values from multiple block address at multiple time points,

see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55 for the restoration process and snapshot reconstruction).

Per claim 28, Wu further teaches configuring the second data store to respond to data requests made to the second data store with the data stored in the first data store at a third time in the past;

requesting fourth data from the second data store;

receiving the fourth data from the second data store; and

determining from the fourth data if the first data store contained the first data at the third time (restoring/reconstructing volume state at any point in time, see col. 9, lines 45-61 and col. 10, lines 12-55; also, one reconstruction process may require the transfer of pre-modification values from multiple block address at multiple time points, see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55 for the restoration process and snapshot reconstruction).

Per claim 29, Wu further teaches the first data is corrupted data (note that corrupted is interpreted as deleted, see col. 10, lines 25-30).

Per claim 31, Wu further teaches the second time and the third time are selected in response to at least one previously completed determining step (it should be clear that restoring/reconstructing volume state at any point in time still requires determining

to which point in time the storage should be restored to, see col. 9, lines 45-61 and col. 10, lines 12-55).

Per claim 32, Wu further teaches the configuring step further comprises communicating the first time to the second data store (see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55 for the restoration process and snapshot reconstruction; the modification log entries include timestamps that indicate at what time the data was modified, the timestamps are recorded by the Modification manager 212, see col. 6, lines 14-37).

Per claim 33, Wu further teaches the configuring step further comprises communicating the first time to the second data store via a channel which is used to communicate the request for second data (see Fig. 2 for the connection between Backup Device 250 and Primary Host 200 which contains the manager software programs; also see the rejection of claim 32 set forth above).

Per claim 34, Wu further teaches the configuring step further comprises communicating the first time to the data store via a different channel than a channel used to communicate the request for second data (see Fig. 2, see the connection between Mirrored Volumes 240 and the Primary Host 200 which contains the manager software programs that retrieve snapshots from the Mirrored Volumes 240 based on time values; also refer to the rejection of claim 33 set forth above).

Note that this rejection is made in view of the instant claim's rejection under 35 USC 112, paragraph 2 as set forth above.

Per claim 35, Wu further teaches the second data store is a virtual representation of the first data store at the first time (the collection of all modification values in the modification log 260 that are used for reconstruction at the first time is a virtual representation of the Mirror Volume 240 at that first time).

Per claim 37, Wu further teaches prior to the configuring step, the step of continuously saving information stored in the first data store before it is overwritten (see col. 4, lines 61-65 and col. 6, lines 14-37).

Per claim 38, Wu further teaches the first time is a time selected from a substantially continuous time interval between a past time and a current time (see col. 7, lines 17-25 and col. 9, lines 45-61; the time can be any point in time).

Per claim 39, Wu further teaches the second data store is configured using a user interface (note here configuration is the setting up of the modification log 260 database to a state that is ready to record and track modifications made to the Mirror Volumes 240; see col. 6, lines 14-37, the format/structure of the modification log 260 must be set up first before it can be used as a database for tracking modifications; the modification log 260 and the manager software programs in Fig. 2 must be

configured/setup by a user through a user interface; also note a user can be a human user or an application or operation system that utilizes the modification log 260).

Per claim 40, Wu further teaches the second data store is configured by an I/O command (it should be clear that any writing or initialization of the Backup Device 250 and the Modification Log 260 is an I/O command).

Per claim 41, Wu further teaches the second data store is configured substantially immediately (note here configuration is interpreted as the recording or tracking by the Modification Log 260 of the modifications made to the Mirrored Volumes 240, the recording is done with a copy-on-write procedure, see the rejection of claim 37 set forth above).

Per claim 42, Wu further teaches the second data store is configured substantially immediately relative to at least one time at which first data was written to the first data store (note here configuration is interpreted as the recording or tracking by the Modification Log 260 of the modifications made to the Mirrored Volumes 240, the recording is done with a copy-on-write procedure, see the rejection of claims 37 and 41 set forth above).

Per claim 43, Wu further teaches the second data store is configured without copying data from the first data store to the second data store (note here configuration

is the setting up of the modification log 260 database to a state that is ready to record and track modifications made to the Mirror Volumes 240; see col. 6, lines 14-37, the format/structure of the modification log 260 must be set up first before it can be used as a database for tracking modifications).

Per claim 44, Wu teaches a method for identifying a time at which a data store was corrupted, comprising the steps of:

(a) configuring a data store to respond to data requests made to the data store (see Fig. 2, Mirrored Volumes 240 and the Modification Log 260 in Backup Device 250 form the data store) with data present in the data store at a first time in the past (retrieve pre-modification values in modification log entries to fulfill reconstruction/restoration requests; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55 for the restoration process and snapshot reconstruction);

(b) requesting data from the data store (data requests are made to the Mirrored Volumes 240 and the Modification Log 260 during the restoration/reconstruction process; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55);

(c) receiving data from the data store in response to the request (values in the modification log entries are received during the restoration/reconstruction process; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55); and

(d) determining from the received data whether the data store was corrupted at the first time (note that corrupted is interpreted as deleted, see col. 10, lines 25-30; the managing software programs shown in Fig. 2 must make this determination, otherwise it

cannot possibly be known that the modification log 260 should be read for snapshot reconstruction at a particular time point, see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55; part of the reconstruction process includes deciding whether to retrieve data from the Mirror Volume 240 or from the Modification Log 260 depending on whether or not the block data has been modified since a particular snapshot for a point in time was made, see col. 10, lines 31-55);

(e) repeating steps (a), (b), (c), and (d) by substituting a second time for the first time (restoring/reconstructing volume state at any point in time, see col. 9, lines 45-61 and col. 10, lines 12-55).

Per claim 50, Wu teaches a method for identifying a time at which a data store was modified in a predetermined manner, comprising the steps of:

(a) configuring a data store to respond to data requests made to the data store (see Fig. 2, Mirrored Volumes 240 and the Modification Log 260 in Backup Device 250 form the data store) with data present in the data store at a first time in the past (retrieve pre-modification values in modification log entries to fulfill reconstruction/restoration requests; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55 for the restoration process and snapshot reconstruction);

(b) requesting data from the data store (data requests are made to the Mirrored Volumes 240 and the Modification Log 260 during the restoration/reconstruction process; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55);

(c) receiving data from the data store in response to the request (values in the modification log entries are received during the restoration/reconstruction process; see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55); and

(d) determining from the received data whether the data store was modified in a predetermined manner at the first time (the managing software programs shown in Fig. 2 must make this determination, otherwise it cannot possibly be known that the modification log 260 should be read for snapshot reconstruction at a particular time point, see col. 6, line 65 to col. 7, line 25, col. 9, lines 45-61 and col. 10, lines 12-55; part of the reconstruction process includes deciding whether to retrieve data from the Mirror Volume 240 or from the Modification Log 260 depending on whether or not the block data has been modified since a particular snapshot for a point in time was made, see col. 10, lines 31-55);

(e) repeating steps (a), (b), (c), and (d) by substituting a second time for the first time (restoring/reconstructing volume state at any point in time, see col. 9, lines 45-61 and col. 10, lines 12-55).

Allowable Subject Matter

10. Claims 36, 45-49 and 51-55 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Gu whose telephone number is (571) 272-0703. The examiner can normally be reached on 9am-5pm, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/SHAWN GU/

Shawn X Gu
Patent Examiner
Art Unit 2189

10 September 2008

/Reginald G. Bragdon/
Supervisory Patent Examiner, Art Unit 2189